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Garg et al.

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(54) **USER INTERFACE FOR FLEET ROUTING SYSTEM**

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(22) Filed: **Jun. 19, 2023**

(51) **Int. Cl.**

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G06Q 10/0631	(2023.01)
G06Q 50/30	(2012.01)

(52) **U.S. Cl.**
CPC ***G06Q 10/06312*** (2013.01); ***G06Q 50/30*** (2013.01)

(58) **Field of Classification Search**
None
See application file for complete search history.

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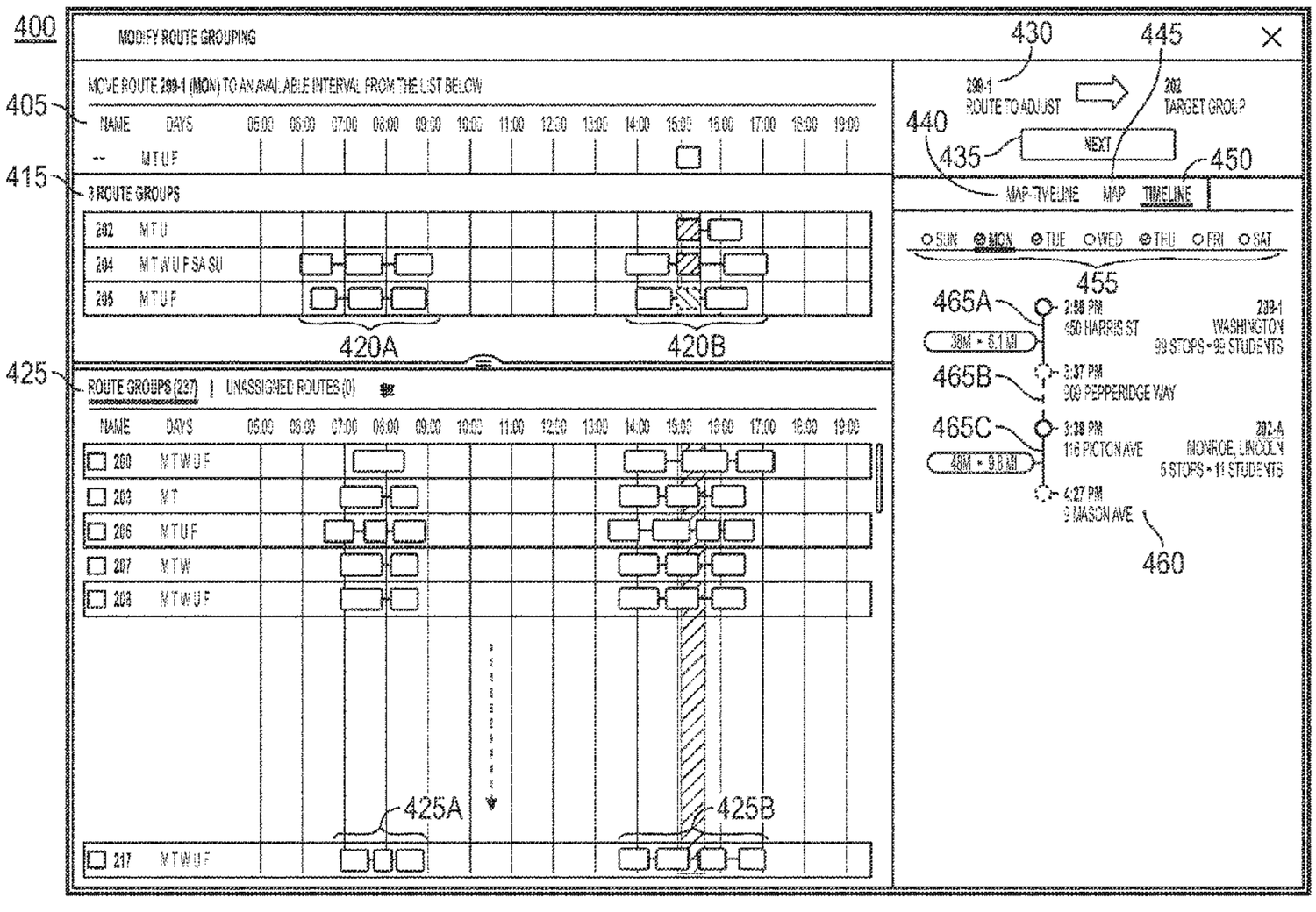
(57) **ABSTRACT**

A graphical user interface and a system are provided which include a route identification interface element which specifies a new route for a vehicle, a plurality of route type buttons, a vehicle type interface, a stop order interface, a map, a control button, and an assignment button. The stop order interface identifies one or more stops for a vehicle in a fleet of vehicles. The map identifies the new route and the one or more stops graphically on the graphical user interface. The control button provides a utilization view for the one or more vehicles in the fleet of vehicles from which a vehicle from the one or more vehicles in the fleet of vehicles that are available can be assigned to the new route.

20 Claims, 8 Drawing Sheets



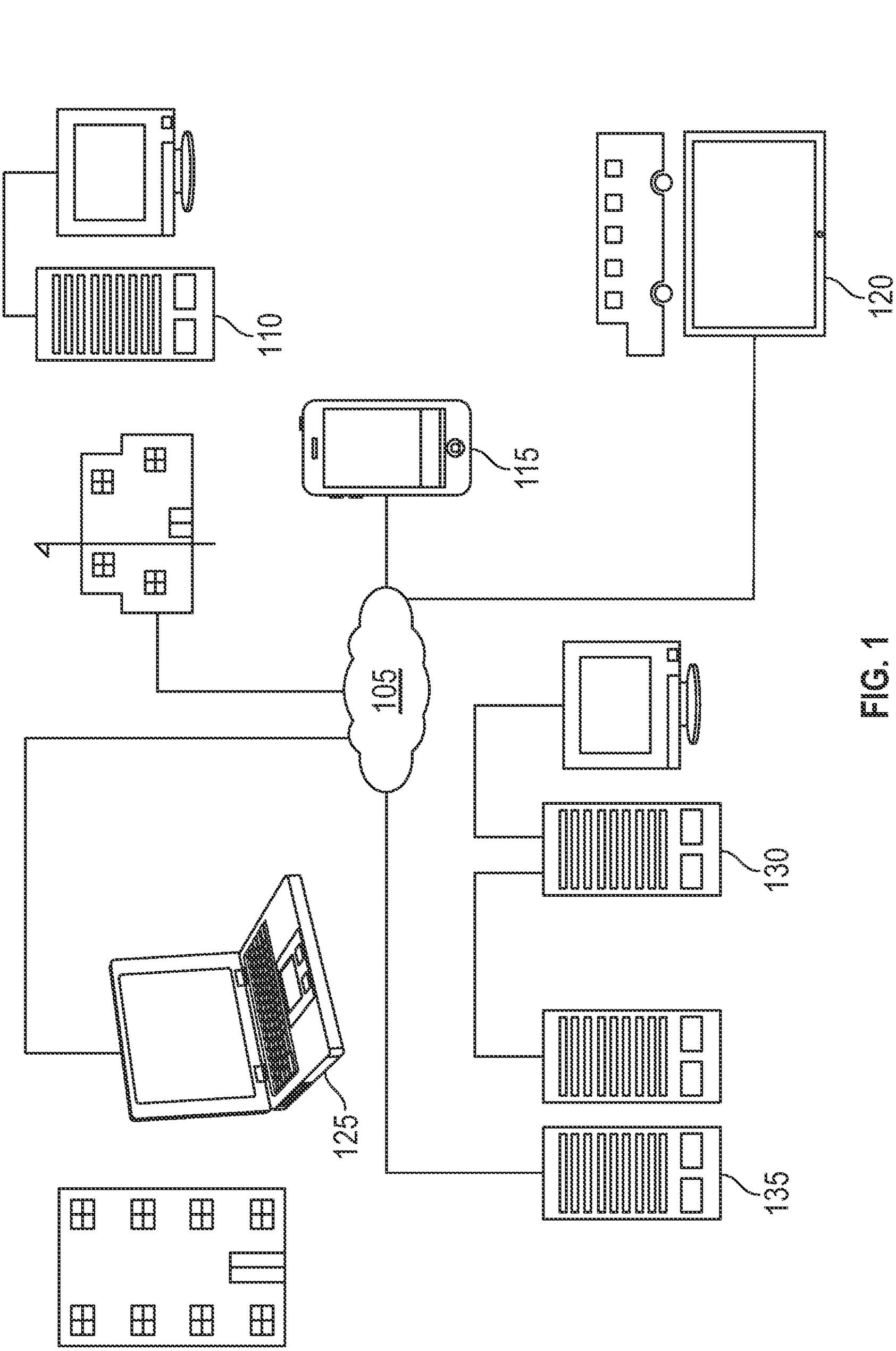


FIG. 1

FIG. 2

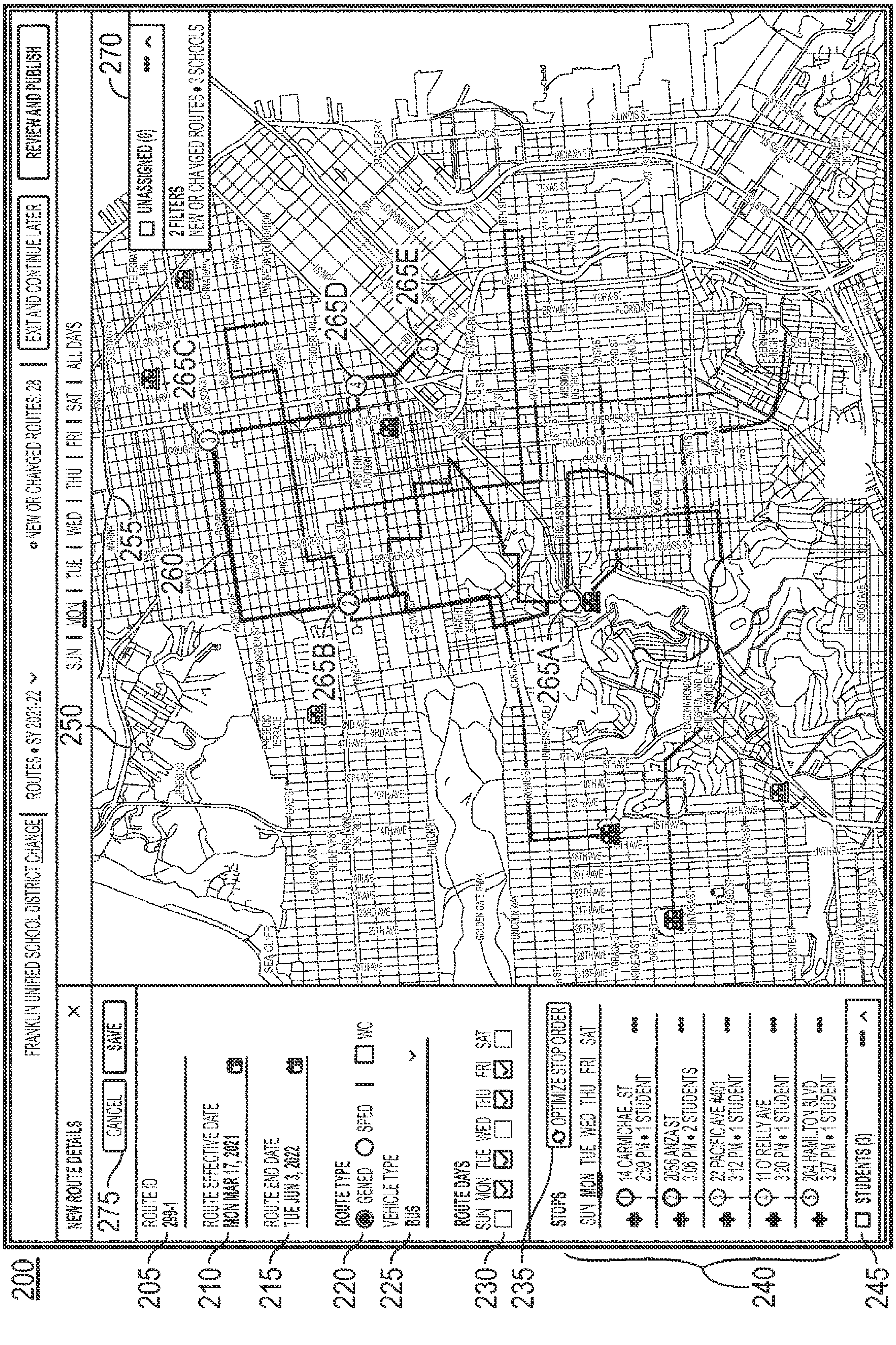

200
FRANKLIN UNIFIED SCHOOL DISTRICT CHANGE
ROUTES • SY 2021-22
• NEW OR CHANGED ROUTES: 28
EXIT AND CONTINUE LATER
REVIEW AND PUBLISH
SUN MON TUE WED THU FRI SAT ALL DAYS
250
255
260
265A
265B
265C
265D
265E
270
UNASSIGNED (0)
2 FILTERS
NEW OR CHANGED ROUTES • 3 SCHOOLS
275
NEW ROUTE DETAILS
CANCEL
SAVE
ROUTE ID
299-1
ROUTE EFFECTIVE DATE
MON MAR 17, 2021
ROUTE END DATE
TUE JUN 3, 2022
ROUTE TYPE
GENED
SPED
WC
VEHICLE TYPE
BUS
ROUTE DAYS
SUN MON TUE WED THU FRI SAT
OPTIMIZE STOP ORDER
STOPS
SUN MON TUE WED THU FRI SAT
14 CARMICHAEL ST
2:59 PM • 1 STUDENT
2056 ANZA ST
3:06 PM • 2 STUDENTS
23 PACIFIC AVE #401
3:12 PM • 1 STUDENT
11 O' REILLY AVE
3:20 PM • 1 STUDENT
204 HAMILTON BLVD
3:27 PM • 1 STUDENT
STUDENTS (3)
205
210
215
220
225
230
235
240
245

FIG. 3

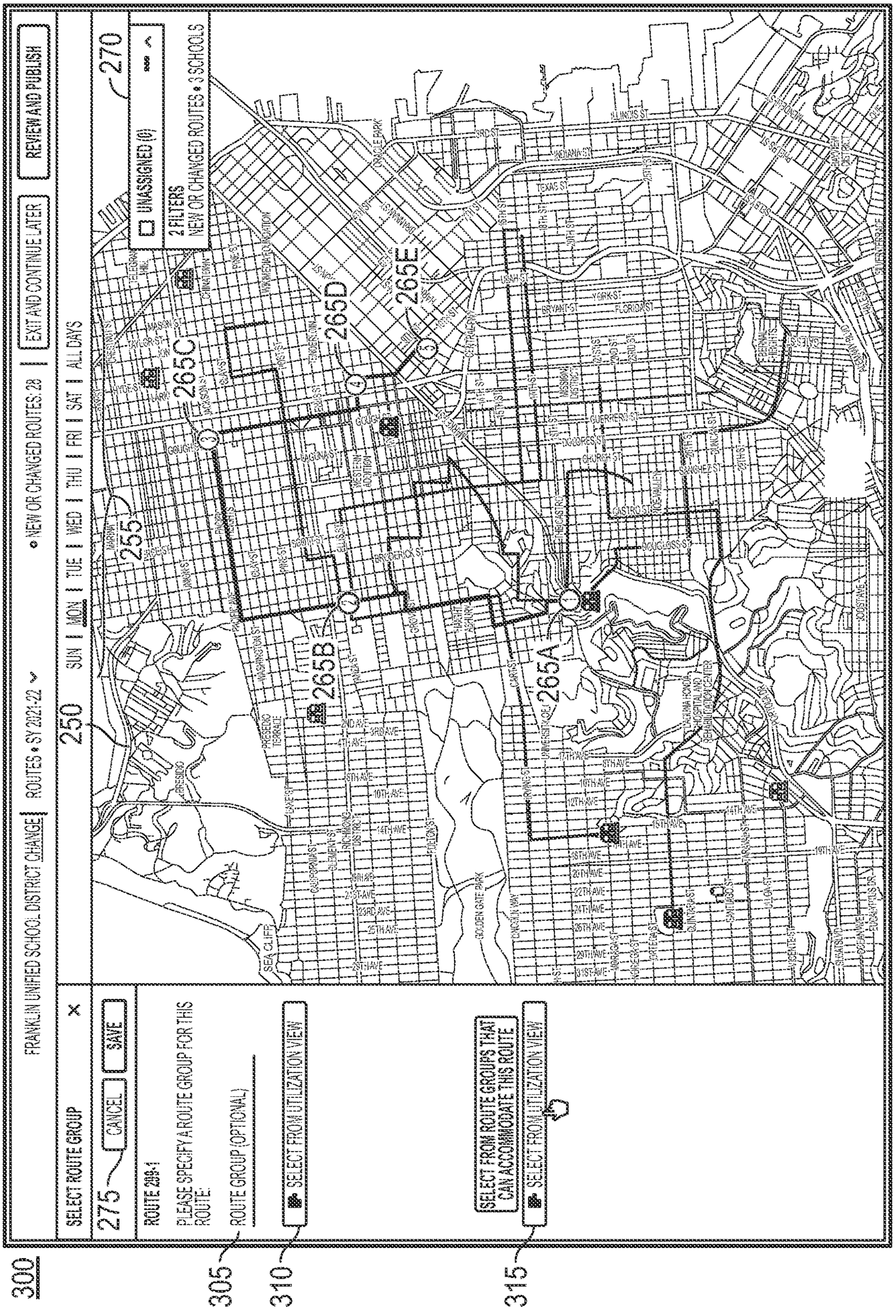

300
FRANKLIN UNIFIED SCHOOL DISTRICT
SELECT ROUTE GROUP
275
CANCEL
SAVE
ROUTE 299-1
PLEASE SPECIFY A ROUTE GROUP FOR THIS ROUTE:
ROUTE GROUP (OPTIONAL)
305
SELECT FROM UTILIZATION VIEW
310
SELECT FROM ROUTE GROUPS THAT CAN ACCOMMODATE THIS ROUTE
SELECT FROM UTILIZATION VIEW
315
250
SUN | MON | TUE | WED | THU | FRI | SAT | ALL DAYS
DISTRICT CHANGE
ROUTES • SY 2021-22
NEW OR CHANGED ROUTES: 28
EXIT AND CONTINUE LATER
REVIEW AND PUBLISH
270
UNASSIGNED (0)
2 FILTERS
NEW OR CHANGED ROUTES • 3 SCHOOLS
265A
265B
265C
265D
265E
255

FIG. 4

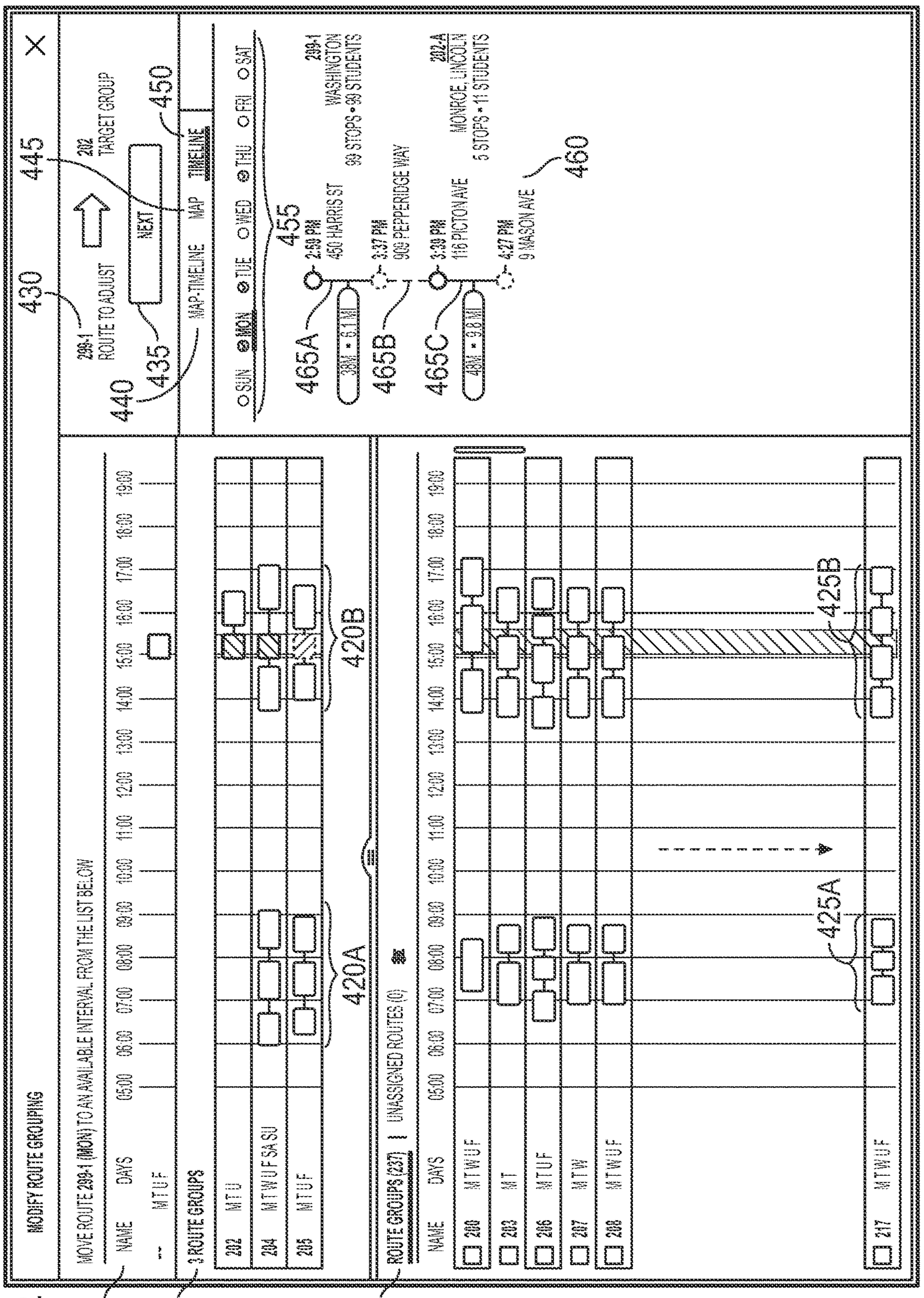

400
MODIFY ROUTE GROUPING
MOVE ROUTE 299-1 (MON) TO AN AVAILABLE INTERVAL FROM THE LIST BELOW
NAME DAYS 05:00 06:00 07:00 08:00 09:00 10:00 11:00
-- M T U F
3 ROUTE GROUPS
202 M T U
204 M T W U F SA SU
205 M T U F
420A
420B
ROUTE GROUPS (237) UNASSIGNED ROUTES (0)
NAME DAYS 05:00 06:00 07:00 08:00 09:00 10:00 11:00
288 M T W U F
283 M T
286 M T U F
287 M T W
288 M T W U F
217 M T W U F
425A
425B
405
415
425
430
435
440
445
450
455
460
465A
465B
465C
299-1
ROUTE TO ADJUST
MAP-TIMELINE
202
TARGET GROUP
NEXT
TIMELINE
MAP
SUN MON TUE WED THU FRI SAT
2:59 PM
450 HARRIS ST
99 STOPS • 99 STUDENTS
299-1
WASHINGTON
3:37 PM
909 PEPPERIDGE WAY
3:39 PM
116 PICTON AVE
282-A
MONROE, LINCOLN
5 STOPS • 11 STUDENTS
4:27 PM
9 MASON AVE
38M • 6.1 MI
48M • 9.8 MI

FIG. 5

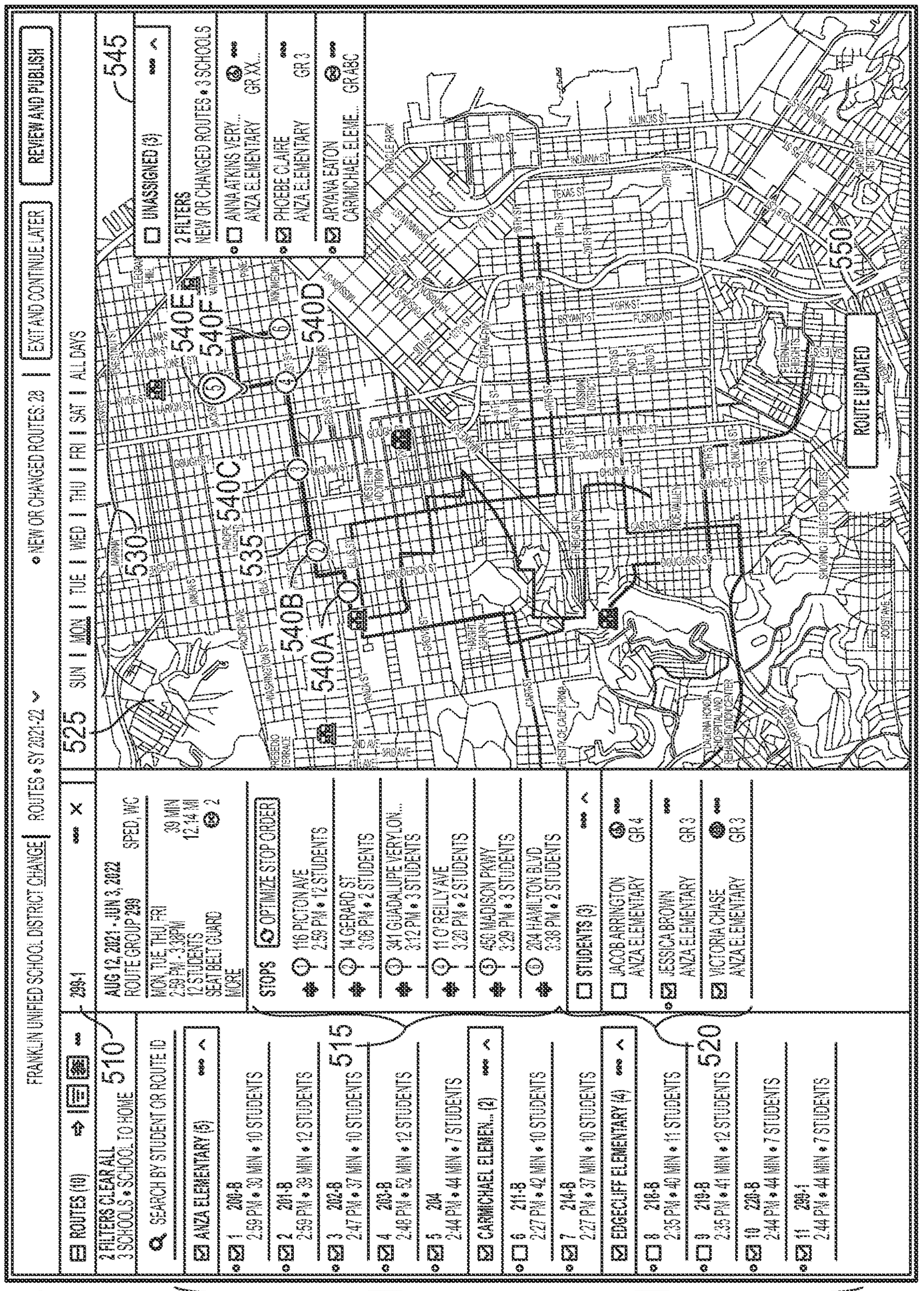
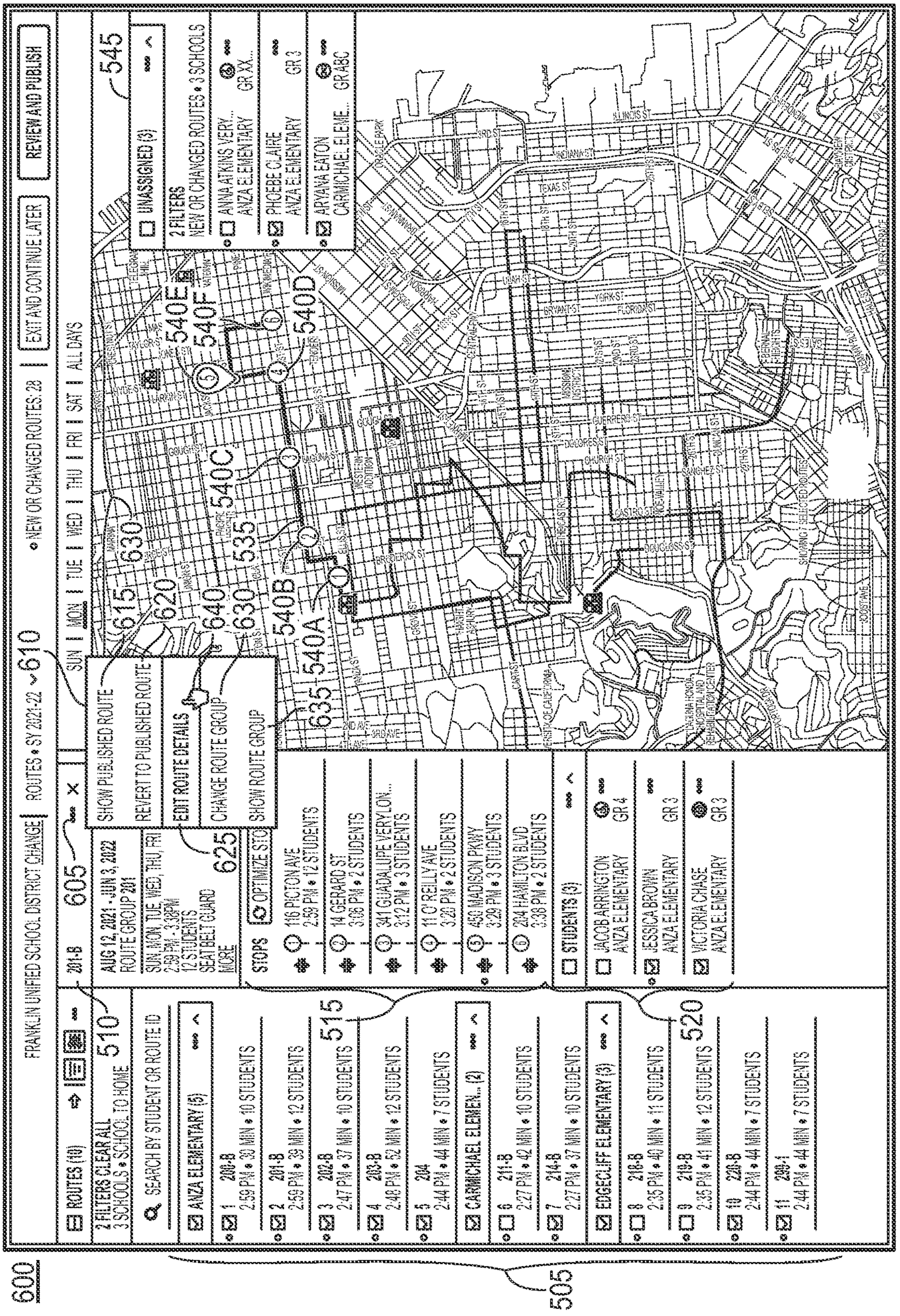

500
505
510
515
520
525
530
535
540A
540B
540C
540D
540E
540F
545
550
FRANKLIN UNIFIED SCHOOL DISTRICT CHANGE
ROUTES (10)
299-1
2 FILTERS CLEAR ALL
3 SCHOOLS • SCHOOL TO HOME
SEARCH BY STUDENT OR ROUTE ID
ANZA ELEMENTARY (5)
1 200-B 2:59 PM • 30 MIN • 10 STUDENTS
2 201-B 2:59 PM • 39 MIN • 12 STUDENTS
3 202-B 2:47 PM • 37 MIN • 10 STUDENTS
4 203-B 2:48 PM • 52 MIN • 12 STUDENTS
5 204 2:44 PM • 44 MIN • 7 STUDENTS
CARMICHAEL ELEMEN... (2)
6 211-B 2:27 PM • 42 MIN • 10 STUDENTS
7 214-B 2:27 PM • 37 MIN • 10 STUDENTS
EDGECLIFF ELEMENTARY (4)
8 218-B 2:35 PM • 40 MIN • 11 STUDENTS
9 219-B 2:35 PM • 41 MIN • 12 STUDENTS
10 220-B 2:44 PM • 44 MIN • 7 STUDENTS
11 299-1 2:44 PM • 44 MIN • 7 STUDENTS
AUG 12, 2021 - JUN 3, 2022
ROUTE GROUP 299
SPED, WC
MON, TUE, THU, FRI
2:59 PM - 3:38PM
12 STUDENTS
SEAT BELT GUARD
MORE
39 MIN
12.14 MI
2
STOPS
OPTIMIZE STOP ORDER
1 116 PICTON AVE 2:59 PM • 12 STUDENTS
2 14 GERARD ST 3:06 PM • 2 STUDENTS
3 341 GUADALUPE VERY... 3:12 PM • 3 STUDENTS
4 11 O' REILLY AVE 3:20 PM • 2 STUDENTS
5 450 MADISON PKWY 3:29 PM • 3 STUDENTS
6 204 HAMILTON BLVD 3:38 PM • 2 STUDENTS
STUDENTS (3)
JACOB ARRINGTON ANZA ELEMENTARY GR 4
JESSICA BROWN ANZA ELEMENTARY GR 3
VICTORIA CHASE ANZA ELEMENTARY GR 3
ROUTES • SY 2021-22
NEW OR CHANGED ROUTES: 28
EXIT AND CONTINUE LATER
REVIEW AND PUBLISH
SUN | MON | TUE | WED | THU | FRI | SAT | ALL DAYS
UNASSIGNED (3)
2 FILTERS
NEW OR CHANGED ROUTES • 3 SCHOOLS
ANNA ATKINS VERY... ANZA ELEMENTARY GR XX...
PHOEBE CLAIRE ANZA ELEMENTARY GR 3
ARYANA EATON CARMICHAEL ELEME... GR ABC
ROUTE UPDATED
SHOWING 7 SELECTED ROUTES

FIG. 6


600
FRANKLIN UNIFIED SCHOOL DISTRICT CHANGE
ROUTES • SY 2021-22
610
NEW OR CHANGED ROUTES: 28
EXIT AND CONTINUE LATER
REVIEW AND PUBLISH
SUN | MON | TUE | WED | THU | FRI | SAT | ALL DAYS
545
UNASSIGNED (3)
2 FILTERS
NEW OR CHANGED ROUTES • 3 SCHOOLS
ANNA ATKINS VERY...
ANZA ELEMENTARY
GR XX...
PHOEBE CLAIRE
ANZA ELEMENTARY
GR 3
ARYANA EATON
CARMICHAEL ELEME...
GR ABC
SHOW PUBLISHED ROUTE
REVERT TO PUBLISHED ROUTE
EDIT ROUTE DETAILS
CHANGE ROUTE GROUP
SHOW ROUTE GROUP
615
630
620
640
630
535
540B
540A
635
540C
540D
540E
540F
625
605
201-B
AUG 12, 2021 - JUN 3, 2022
ROUTE GROUP 201
SUN, MON, TUE, WED, THU, FRI
2:59 PM - 3:39 PM
12 STUDENTS
SEAT BELT GUARD
MORE
STOPS
OPTIMIZE STO
116 PICTON AVE
2:59 PM • 12 STUDENTS
14 GERARD ST
3:06 PM • 2 STUDENTS
341 GUADALUPE VERYL...
3:12 PM • 3 STUDENTS
11 O' REILLY AVE
3:20 PM • 2 STUDENTS
450 MADISON PKWY
3:29 PM • 3 STUDENTS
204 HAMILTON BLVD
3:38 PM • 2 STUDENTS
STUDENTS (3)
JACOB ARRINGTON
ANZA ELEMENTARY
GR 4
JESSICA BROWN
ANZA ELEMENTARY
GR 3
VICTORIA CHASE
ANZA ELEMENTARY
GR 3
505
ROUTES (10)
2 FILTERS CLEAR ALL
3 SCHOOLS • SCHOOL TO HOME
510
SEARCH BY STUDENT OR ROUTE ID
ANZA ELEMENTARY (5)
1 200-B
2:59 PM • 30 MIN • 10 STUDENTS
2 201-B
2:59 PM • 39 MIN • 12 STUDENTS
3 202-B
2:47 PM • 37 MIN • 10 STUDENTS
515
4 203-B
2:48 PM • 52 MIN • 12 STUDENTS
5 204
2:44 PM • 44 MIN • 7 STUDENTS
CARMICHAEL ELEMEN... (2)
6 211-B
2:27 PM • 42 MIN • 10 STUDENTS
7 214-B
2:27 PM • 37 MIN • 10 STUDENTS
EDGECLIFF ELEMENTARY (3)
8 218-B
2:35 PM • 40 MIN • 11 STUDENTS
9 219-B
2:35 PM • 41 MIN • 12 STUDENTS
520
10 220-B
2:44 PM • 44 MIN • 7 STUDENTS
11 200-1
2:44 PM • 44 MIN • 7 STUDENTS

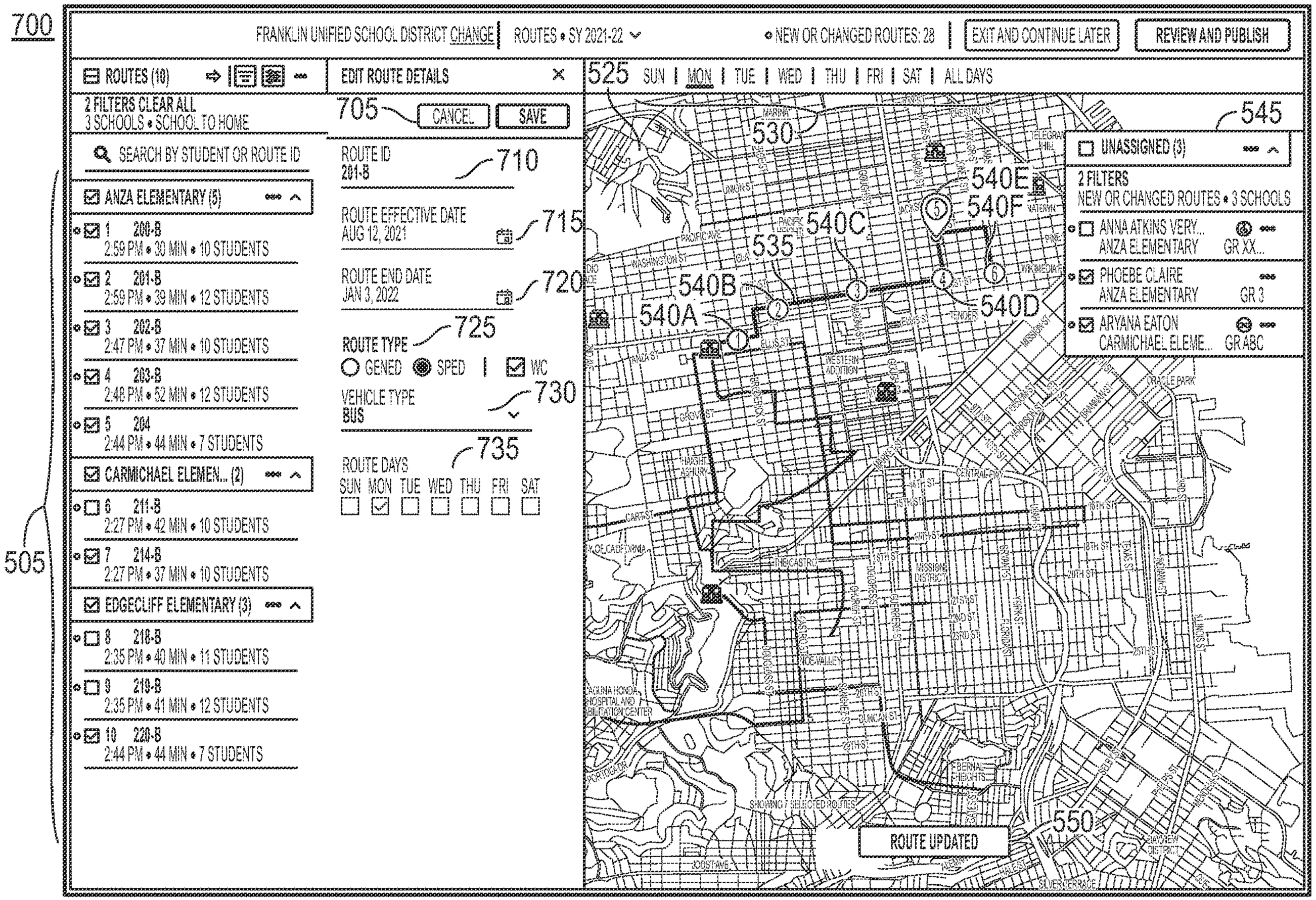

700
FRANKLIN UNIFIED SCHOOL DISTRICT CHANGE
ROUTES • SY 2021-22
NEW OR CHANGED ROUTES: 28
EXIT AND CONTINUE LATER
REVIEW AND PUBLISH
ROUTES (10)
EDIT ROUTE DETAILS
2 FILTERS CLEAR ALL
3 SCHOOLS • SCHOOL TO HOME
705
CANCEL
SAVE
SEARCH BY STUDENT OR ROUTE ID
ANZA ELEMENTARY (5)
1 200-B
2:59 PM • 30 MIN • 10 STUDENTS
2 201-B
2:59 PM • 39 MIN • 12 STUDENTS
3 202-B
2:47 PM • 37 MIN • 10 STUDENTS
4 203-B
2:48 PM • 52 MIN • 12 STUDENTS
5 204
2:44 PM • 44 MIN • 7 STUDENTS
CARMICHAEL ELEMEN... (2)
6 211-B
2:27 PM • 42 MIN • 10 STUDENTS
7 214-B
2:27 PM • 37 MIN • 10 STUDENTS
EDGECLIFF ELEMENTARY (3)
8 216-B
2:35 PM • 40 MIN • 11 STUDENTS
9 219-B
2:35 PM • 41 MIN • 12 STUDENTS
10 220-B
2:44 PM • 44 MIN • 7 STUDENTS
505
ROUTE ID
201-B
710
ROUTE EFFECTIVE DATE
AUG 12, 2021
715
ROUTE END DATE
JAN 3, 2022
720
ROUTE TYPE
725
GENED SPED WC
VEHICLE TYPE
BUS
730
ROUTE DAYS
735
SUN MON TUE WED THU FRI SAT
525
SUN MON TUE WED THU FRI SAT ALL DAYS
545
UNASSIGNED (3)
2 FILTERS
NEW OR CHANGED ROUTES • 3 SCHOOLS
ANNA ATKINS VERY...
ANZA ELEMENTARY GR XX...
PHOEBE CLAIRE
ANZA ELEMENTARY GR 3
ARYANA EATON
CARMICHAEL ELEME... GR ABC
530
535
540A
540B
540C
540D
540E
540F
550
SHOWING 7 SELECTED ROUTES
ROUTE UPDATED

FIG. 7

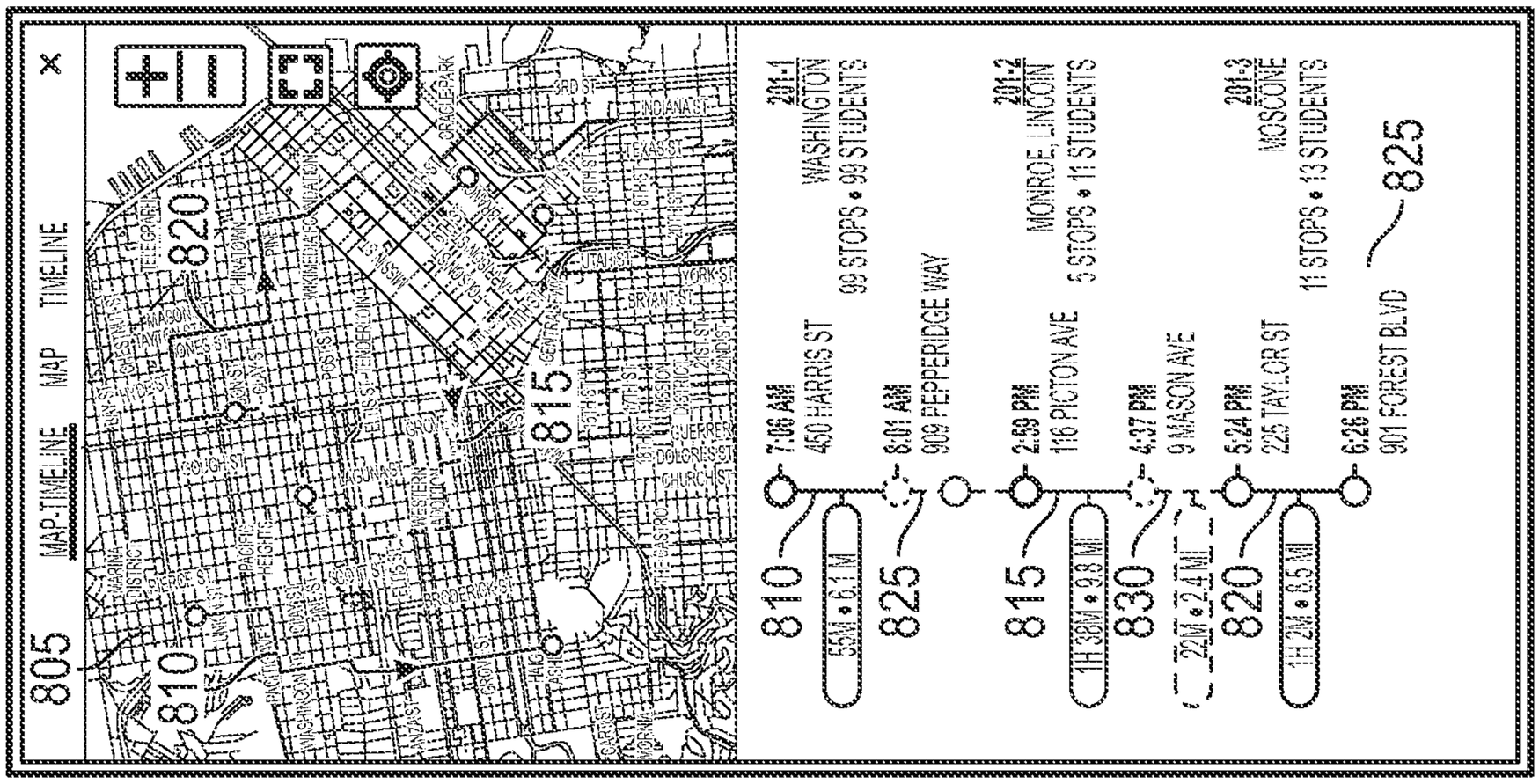

800
805
MAP-TIMELINE
MAP
TIMELINE
810
820
815
825
830
7:06 AM
450 HARRIS ST
55M • 6.1 M
8:01 AM
909 PEPPERIDGE WAY
2:59 PM
116 PICTON AVE
1H 38M • 9.8 MI
4:37 PM
9 MASON AVE
22M • 2.4 MI
5:24 PM
225 TAYLOR ST
1H 2M • 8.5 MI
6:26 PM
901 FOREST BLVD
201-1
WASHINGTON
99 STOPS • 99 STUDENTS
201-2
MONROE, LINCOLN
5 STOPS • 11 STUDENTS
201-3
MOSCONE
11 STOPS • 13 STUDENTS

FIG. 8

USER INTERFACE FOR FLEET ROUTING SYSTEM

TECHNICAL FIELD

The present application discloses a user interface for systems for routing a fleet of vehicles, scheduling stops, and optimizing those routes and stops based on one or more elements of primary concern.

BACKGROUND

The earliest advent of a fleet of vehicles likely dates back to antiquity when vehicles became necessary for the transport of people and goods. Fleets of boats are known to have existed in ancient Greece while fleets of chariots were known to have been used in ancient wars both as vehicles of war and as transport vehicles for soldiers and supplies. Even horses themselves have been used for the purpose of transporting people and goods. Indeed, many ancient stories of certain battles turn on the use of fleets of vehicles and their relative coordination in both timing and goals to the win or loss of a battle.

In the more recent past, trains, sail powered boats, and ocean liners were assembled into fleets for both military and civilian use. Since trips across continents or across oceans were typically of an extended duration, schedules and stops for these vehicles, especially in the context of civilian use, were published well in advance of an actual date of embarkation. These dates and schedules were largely accurate given the need to be at a next stop or location in a certain amount of time. Many ocean liners, for example, stopped in multiple ports to pick up passengers and goods before transporting both across the ocean. Trains kept a specific schedule on a time duration basis. For example, a train may leave from Paris for Berlin every other day allowing time for a day to make the trip from Paris to Berlin and a day to make the trip back. At the same time, other trains may have traveled from Trenton, New Jersey to New York City, New York several times per day. Historically, these schedules were based on the number of vehicles available and on the travel time necessary for trips between stops.

The advent of the modern automobile changed transportation all across the world on seemingly an overnight basis, at least in retrospect. Motorized land based transportation without the aid of rails made automobiles the transport method of choice for anything that was not too heavy or far away. Trucks could easily carry people and goods over short distances with very little notice, which was a major development for transportation. Buses became the vehicle of choice for transporting people as buses were fitted with seats for people. Trucks became the vehicle of choice for transporting goods from one place to another. As the relative prices of automobiles decreased and World Wars broke out, automobile fleets came into existence. Fleets of buses took passengers to places where rails did not exist while fleets of trucks took goods from boats in the harbor to soldiers fighting inland.

Fleet logistics became an issue of major importance to military and civilian fleet owners alike. It became imperative to ensure that certain vehicles were available for certain transportation tasks on a periodic basis, whether that basis was a multiple times per day basis, a day to day basis, a weekly basis, or some other periodic basis. Automobiles became different from fleet vehicles such as trains, boats, and other ocean going vessels because automobiles could schedule multiple trips per day while making repeated visits

to a logistical hub or supply center. The pace at which trucks could supply goods outstripped anything that was previously known to human civilization and made the delivery of goods possible at scale. Buses developed scheduled times and routes for conveying passengers along certain routes at certain times.

Today, massive fleets of vehicles are owned by both governmental and private institutions to facilitate the transport of goods and passengers, which is a major logistics endeavor. Fleet vehicles may have routes which are traveled on a periodic basis to serve customers in various capacities. For example, mail is delivered to virtually every home in the United States on a daily basis by mail carriers in individual trucks. Other private mail or companies and goods delivery companies also have fleets of trucks to provide mail service for individual customers. Similarly, local governmental entities operate bus lines for mass transit of passengers, typically in and out of big cities. Public bus lines, for example, use main routes with spurs that serve residential areas of a city to facilitate passengers traveling into and out from the city on a daily basis. Both public and private schools operate bus lines to safely transport children to and from school on a daily basis. School buses, however, usually operate based on stopping at certain places at certain times to safely load children to attend local schools and, for that reason, travel routes that are based on where children live, generally speaking.

Logistics for these fleets are incredibly complex, which has been a persistent problem since antiquity. Horse cavalry attacking at the wrong time on an ancient Greek battlefield and buses arriving off schedule are different implementations of the same problem spread thousands of years apart. Maintenance, location, routing, fueling, and driver support are also considerations for fleet vehicles in order to deliver passengers or goods to a particular place by a particular time. In the context of school buses, a bus may be late because of a breakdown, construction delays, fuel problems, or a missing driver which may cause a child to be late for school. Further, school buses may serve redundant routes, which could be accommodated by a single bus, which increases the relative costs of providing bus services on virtually a daily basis. Those costs may include pollution due to emissions, fuel costs, driver costs, costs in time, and others. Current solutions are not only inefficient but wasteful and contribute to cumulative emissions based environmental harm. Optimization is needed to reduce financial, pollution, and time costs in fleet vehicle use and routing.

It is, therefore, one object of this disclosure to provide a user interface that facilitates a routing system which optimizes routes for fleet vehicles. It is another object of this disclosure to provide a user interface for a routing system which optimizes routing and stop timing for fleet vehicles across an entire vehicle fleet.

SUMMARY OF THE DISCLOSURE

A graphical user interface is provided which include a route identification interface element which specifies a new route for a vehicle, a plurality of route type buttons, a vehicle type interface, a stop order interface, a map, a control button, and an assignment button. The stop order interface identifies one or more stops for a vehicle in a fleet of vehicles. The map identifies the new route and the one or more stops graphically on the graphical user interface. The control button provides a utilization view for the one or more vehicles in the fleet of vehicles from which a vehicle from

the one or more vehicles in the fleet of vehicles that are available can be assigned to the new route.

A system provides a graphical user interface displayed on a device screen associated with a user. The user may be a provider, an administrator, or a ride requestor. The graphical user interface may include a route identification interface element which specifies a new route for a vehicle, a plurality of route type buttons, a vehicle type interface, a stop order interface, a map, a control button, and an assignment button. The stop order interface identifies one or more stops for a vehicle in a fleet of vehicles. The map identifies the new route and the one or more stops graphically on the graphical user interface. The control button provides a utilization view for the one or more vehicles in the fleet of vehicles from which a vehicle from the one or more vehicles in the fleet of vehicles that are available can be assigned to the new route.

BRIEF DESCRIPTION OF THE DRAWINGS

Non-limiting and non-exhaustive implementations of the disclosure are described with reference to the following figures, wherein like reference numerals refer to like parts throughout the various views unless otherwise specified. Advantages of the disclosure will become better understood with regard to the following description and accompanying drawings where:

FIG. **1** illustrates box diagram of a fleet routing system.

FIG. **2** illustrates an exemplary embodiment of a user interface executed by the fleet routing system.

FIG. **3** illustrates an exemplary embodiment of a user interface providing access to a fleet based utilization view in the fleet routing system.

FIG. **4** illustrates an exemplary embodiment of a user interface providing a fleet based utilization view in the fleet routing system.

FIG. **5** illustrates an exemplary embodiment of a user interface illustrating a view of fleet routes in the fleet routing system.

FIG. **6** illustrates an exemplary embodiment of a user interface illustrating a view of fleet routes with menu for editing route details in the fleet routing system.

FIG. **7** illustrates an exemplary embodiment of a user interface for editing route details in the fleet routing system.

FIG. **8** illustrates an exemplary embodiment of a user interface illustrating a map with route identification and timing in the fleet routing system.

DETAILED DESCRIPTION

The disclosure extends to vehicles of all types which are assembled into a fleet for a common purpose or goal such as, but not limited to, delivering passengers, delivering goods, or any other purpose.

In the following description of the disclosure, reference is made to the accompanying drawings, which form a part hereof, and in which is shown by way of illustration specific implementations in which the disclosure is may be practiced. It is understood that other implementations may be utilized and structural changes may be made without departing from the scope of the disclosure.

In the following description, for purposes of explanation and not limitation, specific techniques and embodiments are set forth, such as particular techniques and configurations, in order to provide a thorough understanding of the device disclosed herein. While the techniques and embodiments will primarily be described in context with the accompanying drawings, those skilled in the art will further appreciate that the techniques and embodiments may also be practiced in other similar devices.

Reference will now be made in detail to the exemplary embodiments, examples of which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers are used throughout the drawings to refer to the same or like parts. It is further noted that elements disclosed with respect to particular embodiments are not restricted to only those embodiments in which they are described. For example, an element described in reference to one embodiment or figure, may be alternatively included in another embodiment or figure regardless of whether or not those elements are shown or described in another embodiment or figure. In other words, elements in the figures may be interchangeable between various embodiments disclosed herein, whether shown or not.

FIG. **1** illustrates a box diagram of a fleet routing system **100**. Fleet routing system may be implemented by use of a communications network **105** such as the Internet, which facilitates the exchange of information between various devices within fleet routing system **100**. Fleet routing system may be used with any fleet but is described with respect to a fleet of school buses. The techniques disclosed herein may be used to deliver passengers or goods with little or no modification. Fleet routing system **100** may be implemented between a ride requestor device, such as a school device **110** (and/or an administration level device **125**, which will be discussed below) and a user device **115**, and a driver device **120** associated with a bus driver, for example. Fleet routing system **100** may be implemented by an administrator device **125**. A provider may provide the administrator device **125** or the ride requestor device **110** with access to fleet routing system **100** by use of servers **135** and provider device **130**. In one implementation, a school district may use administration level device **125** which provides buses to pick up and deliver children to a school and operate in a manner similar to ride requestor device **110**. In other embodiments, ride requestor device **110** may be implemented to schedule routing for bus routes for a particular school. In other words, various levels of administration may access and implement fleet routing system **100** according to their particular needs for the delivery of passengers.

At the outset, a provider device **130** may give a ride requestor device **110** or an administrator level device **125** access to fleet routing system **100** by servers **135** to create bus routing for a particular school district or school as appropriate. Servers **135** may provide a user interface to ride requestor device **110** or an administrator level device **125** to create routes for each child in the district or school as appropriate. For example, a profile may be created for each child in the district or school as appropriate to be stored in non-volatile non-transitory storage media, which includes a home address for each child. In response, fleet routing system **100** may determine a distance between identified stops and a travel time between each of those identified stops to determine both a single bus route and a number of buses required for a necessary number of routes. For example, based on a standard bus configuration, a school bus may transport **80** seated students. However, due to time and distance constraints, a certain bus may only be able to pick up 45 students at identified stops. The identified stops may be based on ensuring a child does not cross a road or lives within a certain distance of the identified stop. If one location is heavily populated with children who need to board a school bus, optimized routing may determine that since more children are boarding per identified stop, that

particular school bus may need less time to complete an assigned route. In one embodiment, fleet routing system **100** may optimize routes based on the shortest time on the road for each bus, based on minimal fuel usage across the fleet, based on minimal emissions across the fleet, based on or any other basis that is meaningful to the school or community served by the school.

Once the routes are generated with children assigned to a particular bus, server **135** may transmit bus information to user device **115** by fleet routing system **100**. Bus information may include bus stop information for picking up a child and a time for pick up at the bus stop. User device **115** may be associated with the child bus rider or with a parent of the child bus rider. User device **115** may be implemented as separate devices where one device is associated with the child rider and another device is associated with a parent, guardian, or other supervisor of a child. When the school bus is operating, a real time location may be provided to user device **115** so that the child and child supervisor may identify where the bus is currently located. A child or child supervisor may use user device **115** to create the child profile discussed above by providing information from user device **115** through communications network **105** to server **135**.

Further, once the routes are generated, server **135** may transmit individual route information to a bus driver via driver device **120**, in fleet routing system **100**. Individual route information may be a mandatory bus route for the driver to follow with a stop sequence that is identified along the individual route. Individual route information may include turn by turn instructions with expected drive time duration and distance for the bus driver. Driver device **120** may also detect information from a particular bus drive and provide that information to server **135** through communication network **135**. Information provided from driver device **120** may include distance traveled information, fuel use information, pickup duration information, bus stop location information (e.g., information about where the stop is designated versus where the stop actually occurred), speed of travel information (in terms of actual speeding and in terms of slowdowns caused by traffic, construction, or any other road condition), rider verification information, rider disembarking information, and any other information that may be used by server **135** to optimize routing. In one embodiment, driver device **120** may receive an optimized route from server **135** for picking up children based on a home or a school address and/or prior pickup/drop off history locations for children on a particular route. In another embodiment, driver device **120** may further be optimized to prevent U-turns, enforce curbside pickup to avoid children crossing streets. Server **135** may receive information from driver device **120** which it may use to optimize routes based on learning from past driver routes to determine a best path between stops. Server **135** may receive information from driver device **120** which may optimize based on learned roadblocks and driver input to driver device **120** with new information (e.g., a street closure or construction) which causes server **135** to reoptimize the bus route. Server **135** may use information to determine and store driving instructions at the ride route level for a particular bus and driver device **120**. Server **135** may track a bus via driver device **135** during a pickup or drop off ride and ensure compliance with the optimized route. If driver device **120** indicates that a bus is not following optimized route information, server **135** may send a message to ride requestor device **110**, administrator device **125**, or provider device **130** to allow either the ride requestor, the administrator, or the provider to contact the bus driver with route correction instructions.

Based on information received from driver device **120**, server device **135** may maintain estimated global positioning system ("GPS") waypoints and an estimated time of arrival ("ETA") information for each ride, which may be constantly updated based on information provided by driver device **120**. Driver device **120** may further provide real-time routing, navigation, and path information based on a current location of driver device **120**. Routing, navigation, and path information may be displayed on a screen associated with driver device **120**. The user may receive, via user device **115**, expected vehicle path information on a map displayed on a screen of user device **115**. Thus, a user of user device **115** may be able to track bus **120** in real-time and observe where a bus is currently and when a bus will be at a specific stop, which may be identified by waypoints provided to the user from server **135** via user device **115**. Any data received from driver device **120** may be stored as historical data which may be used to further optimize bus routing on a permanent or temporary basis depending on road conditions, pickup/drop off requirements, and any other factor identified herein.

Ride requestor device **110**, user device **115**, driver device **120**, administrator device **125**, and provider device **130** may be implemented as any electronic device with processing power sufficient to share electronic information back and forth through communications network **105**. Examples of ride requestor device **110**, user device **115**, driver device **120**, administrator device **125**, and provider device **130** include mobile phones, desktop computers, laptop computers, tablets, game consoles, personal computers, mobile devices, notebook computers, smart watches, and any other digital device that has the processing ability to interact with server **135**.

Ride requestor device **110**, user device **115**, driver device **120**, administrator device **125**, and provider device **130** may include software and hardware modules that execute computer operations, communicate with communication networks **105** and server **135**. Further, hardware components may include a combination of Central Processing Units ("CPUs"), buses, volatile and non-volatile memory devices, storage units, non-transitory computer-readable storage media, data processors, processing devices, control devices transmitters, receivers, antennas, transceivers, input devices, output devices, network interface devices, and other types of components that are apparent to those skilled in the art. These hardware components within ride requestor device **110**, user device **115**, driver device **120**, administrator device **125**, and provider device **130**, are used to connect with server **135**.

Server **135** may provide web-based access to fleet routing system **100** (or relevant portions based on which device is associated with a particular function—e.g., a parent using user device **115** may not have permissions to reroute buses) to ride requestor device **110**, user device **115**, driver device **120**, administrator device **125**, and provider device **130**. Communication network **105** may be a wired, wireless, or both and facilitate communications in fleet routing system **100**. Server **135** may include cloud computers, super computers, mainframe computers, application servers, catalog servers, communications servers, computing servers, database servers, file servers, game servers, home servers, proxy servers, stand-alone servers, web servers, combinations of one or more of the foregoing examples, and any other computing device that may be used to execute optimized routing and communication for web based fleet routing system **100**. Server computer **135** may be implemented as one or more actual devices but are collectively referred to as server computer **135** may include software and hardware

modules, sequences of instructions, routines, data structures, display interfaces, and other types of structures that execute server computer operations. Further, hardware components may include a combination of Central Processing Units ("CPUs"), buses, volatile and non-volatile memory devices, storage units, non-transitory computer-readable storage media, data processors, processing devices, processors, control devices transmitters, receivers, antennas, transceivers, input devices, output devices, network interface devices, and other types of components that are apparent to those skilled in the art. These hardware components within one or more server **135** may be used to execute the various methods or algorithms disclosed herein, and interface with ride requestor device **110**, user device **115**, driver device **120**, administrator device **125**, and provider device **130**.

In one embodiment, ride requestor device **110**, user device **115**, driver device **120**, administrator device **125**, and provider device **130** may access server **135** by a communication network **105**. In each case, wireless communication network **135** connects ride requestor device **110**, user device **115**, driver device **120**, administrator device **125**, and provider device **130** via an internet connection provided by communication network **105**. Any suitable internet connection may be implemented for wireless communication network **105** including any wired, wireless, or cellular based connections. Examples of these various internet connections include implementations using Wi-Fi, ZigBee, Z-Wave, RF4CE, Ethernet, telephone line, cellular channels, or others that operate in accordance with protocols defined in IEEE (Institute of Electrical and Electronics Engineers) 802.11, 801.11a, 801.11b, 801.11e, 802.11g, 802.11h, 802.11i, 802.11n, 802.16, 802.16d, 802.16e, or 802.16m using any network type including a wide-area network ("WAN"), a local-area network ("LAN"), a 2G network, a 3G network, a 4G network, a 5G network and its successors, a Worldwide Interoperability for Microwave Access (WiMAX) network, a Long Term Evolution (LTE) network, Code-Division Multiple Access (CDMA) network, Wideband CDMA (WCDMA) network, any type of satellite or cellular network, or any other appropriate protocol to facilitate communication between, ride requestor device **110**, user device **115**, driver device **120**, administrator device **125**, and provider device **130** and server **135**.

FIG. **2** illustrates an exemplary embodiment of a user interface **200** executed by fleet routing system **100**. As shown in FIG. **2**, user interface **200** allows a user to create a new route for a particular vehicle in a fleet of vehicles. As previously mentioned, the disclosure herein uses buses, particularly school buses, as an exemplary of a fleet of vehicles. However, the disclosure herein is not limited solely to school buses or buses in general. Any fleet of vehicles may benefit from the techniques described herein. Typically, user interface **200** may be provided from server **135** to provider device **130**, administration device **125**, or ride requestor device **110**. A provider, administrator, or ride requestor may use fleet routing system **100** to create passenger or goods delivery/transportation routes for a particular entity which, in this case, is identified as Franklin Unified School District, although the particular entity could also be a business that delivers goods, a mail company, a fleet based transportation company, trucking company, or any other company that uses a fleet of vehicles to perform services provided by that company.

As shown in user interface **200**, a provider/administrator/requestor user may identify a new route in interface element **205**, a date for the new route to start in interface element **210**, and a date for the new route to end in interface element **215**. Dates shown are for a portion of a school year and are historical merely for explanation based on a previously existing route. User interface **200** may further include route type buttons **220** which allow a provider/administration/requestor user to select a type of route, such as a general education route, a special education route, or identify the need of a wheelchair for a particular route. User interface **200** may also allow a provider/administrator/requestor user to select a desired vehicle type such as a bus, a van, a short bus, a city bus, a truck, or any other type of fleet vehicle for the particular route. The provider/administrator/requestor user may further select the days of the week on which the route should be driven by the selected vehicle.

Optimize button **235** may allow a user to optimize the various stops identified for the particular route. In this case, a plurality of stops **240** are identified from a historical route as well as a plurality of students **245** associated with that plurality of stops **240**. The stop order may be optimized based on a variety of factors, including minimal driving time, minimal time on the road, minimal emitted emissions, minimal fuel use, or any other factor relevant to the community in which the services are provided. At the same time, user interface **200** provides a map **250** which may be changed or selected based on selecting a day (or plurality of days) from map interface buttons **255**. Map **250** may illustrate route **260** for the new route identified in user interface element **205** and a plurality of stops **265**A-**265**E shown in the list of the plurality of stops **240**. The order of stops **265**A-**265**E may be changed based on a user optimizing the stop locations using optimize button **235**. User interface **200** may further provide a list of unassigned riders **200** (or goods in other examples) who or which need to be assigned to route **260**. When information has been provided through user interface **200**, a user may choose to use control buttons **275** (e.g., a cancel button or a save button) to save and publish the new route to fleet routing system **100**.

FIG. **3** illustrates an exemplary embodiment of a user interface **300** for provided access to a fleet routing system **100**. In response to a user saving and publishing the new route to fleet routing system **100** in FIG. **2**, fleet routing system **100** may cause a provider **130**/administrator **125**/requestor **110** device to provide a selection of a particular vehicle to drive according to the selected route. For example, user interface **300** may identify a route group vehicle by user interface element **305** or select a utilization view button **310** to see which vehicles are available to drive the route if no particular vehicle is known. Alternatively, the provider/administrator/requestor user may use their respective devices **130**/**125**/**110** to select another utilization view bottom **315** which provides a view of only those vehicles which are able to accommodate driving the route specified in user interface **200** on the specific days (and times) specified in user interface **200**.

User interface **300** may also provide a user with a view of a map **250**, which may be changed or selected based on selecting a day (or plurality of days) from map interface buttons **255**. Map **250** may illustrate route **260** for the new route identified in user interface element **205** and a plurality of stops **265**A-**265**E shown in the list of the plurality of stops **240**, as discussed with respect to FIG. **2**. User interface **200** may further provide a list of unassigned riders **200** (or goods in other examples) who or which need to be assigned to route **260**. When information has been provided through user interface **300**, a user may choose to use control buttons **275** (e.g., a cancel button or a save button) to save and publish the new route to fleet routing system **100** or select

utilization view button **310** or second utilization view button **315** to view utilization views of fleet vehicles.

FIG. **4** illustrates an exemplary embodiment of a user interface **400** for providing a fleet based utilization view in fleet routing system **100**, shown in FIG. **1**. As shown in FIG. **4**, a new route, route **299-1** identified in interactive element **205** of FIG. **2**, is identified as operating on Mondays, Tuesdays, Thursdays, and Fridays (as shown in interactive element **230** in FIG. **2**) in route identifier **405**. Route identifier **405** also shows that route **299-1** is to be driven beginning at **14**:**59** to **15**:**38**. If a user interacts with second utilization view button **315**, the user may be provided with route groups **415** which illustrate current routes for each of the available vehicles, vehicle numbers **202**, **204**, and **205** (e.g., as a fleet vehicle number or a bus number). Each one of vehicles **202**, **204**, and **205** has an opening between 14:59 and 15:38 on Mondays, Tuesdays, Thursdays, and Fridays. In other words, vehicles **202**, **205**, and **205** have availability to accommodate a new route, such as route **299-1** at the time identified.

As shown in FIG. **4**, each of the routes may be shown in a utilization view to visually illustrate the routes for each vehicle and the times of each individual route. For example, utilization indicators **420**A illustrate that vehicle number **202** has no morning routes while vehicle numbers **205** and **205** both have morning routes at a particular amount of time. Utilization indicators **420**B for vehicle numbers **202**, **204**, and **205** illustrate how the route timing for vehicle numbers **202**, **204**, and **205** may accommodate a new route, such as route **299-1** with a color coding scheme. For example, illustrating route **299-1** as a green block in route groups **415** indicates that route **299-1** would be satisfactory for providing a ride a particular location, time, and day. An orange block in route groups **415** indicates that route **299-1** is available but impractical due to time constraints to add because of travel time between a last stop of a previous route and a next stop of a subsequent route.

If a user interacts with utilization view button **310**, the user may be provided with route groups **425** which illustrate current routes for each of all vehicles, vehicle numbers **200**, **202**, **203**, **204**, **205**, **206**, **207**, **208** . . . **217** (e.g., as a fleet vehicle number or a bus number). Each of the routes may be shown in a utilization view to visually illustrate the routes for each vehicle and the times of each individual route for every vehicle in the fleet in route groups **425**, effectively combining route groups **415** and **425** as shown in FIG. **4**. For example, utilization indicators **425**A illustrate that vehicle numbers **202**, **204**, and **205** have availability for a new route, while also illustrating utilization for vehicle numbers **200**, **203**, **206**, **207**, **208**, . . . **217** for morning routes. Utilization indicators **425**B for vehicle numbers **202**, **204**, and **205** illustrate how the route timing for vehicle numbers **202**, **204**, and **205** may accommodate a new route, such as route **299-1**, but also illustrate that vehicle numbers **200**, **203**, **206**, **207**, **208** . . . **217** have routes or travel between routes that are either overlapping the times or days required by route **299-1**. A color coded bar may be provided within route **425**B, that corresponds to route **299-1** illustrating the potential overlap in travel time between routes or routes themselves which is overlaid by the routes for each individual fleet vehicle to provide a visual representation of which vehicles could or could not accommodate a new route, such as route **299-1**. The color coded bar may illustrate a duration of route **299-1** and show that other vehicles are being utilized during that particular route duration for route **299-1**.

User interface **400** may further provide an overview element **430** which illustrates to a provider/administrator/requestor user that the provider/administrator/requestor user is attempting to add a new route, route **299-1** to vehicle **202** and provide an assignment button **435** to create and assign the new route to a vehicle. User interface **400** may further provide a visual representation of a map and timeline with map-timeline button **440**, a map by map button **445**, and a timeline by timeline button **450** which may provide a provider/administrator/requestor user with visual information about how the new route **299-1**, would look if route **299-1** was assigned to vehicle **202**. As shown in FIG. **4**, timeline button **550** is selected which may then be augmented by selecting a daily view button **455** to provide a display of a route for vehicle **202** which incorporates new route **299-1** while also providing the originally assigned route, **202**A. Timeline view **460** illustrates that on Mondays, route **299-1** (element number **465**A) begins at 2:49 pm at 450 Harris St., has a duration of 38 minutes over a distance of 6.1 miles and has 99 stops with 99 students, as merely an explanatory route. Route **299-1** ends at 3:37 pm at 909 Pepperidge Way and begins to travel (element **465**B) to the next pickup location at 3:39 at 116 Picton Avenue for route **202**-A. At 116 Picton Avenue, route **202**-A commences (element **465**C) to drive for 48 minutes over a distance of 9.9 miles across 5 stops for 11 students. Route **202**-A ends at 9 Mason Avenue at 4:27 PM. Timeline view **460** may be color coded such that route **299-1** (element **465**A) may be blue, while route **202**-A (element **465**C) may be purple, for example. The color coding may be used on a map view if map button **445** is selected such that the route in the timeline and the route in the map are illustrated as being in the same color for representative consistency.

FIG. **5** illustrates an exemplary embodiment of a user interface **500** illustrating a view of fleet routes in fleet routing system **100**. User interface **500** illustrates a view of all fleet routes for a particular entity. As previously discussed, an entity could be any governmental entity or company that operates a fleet of vehicles, although as shown in FIG. **5**, an exemplary bus route is provided on, for example, a provider device **130** or an administrator device **125** where the administrator is an administrator of the entity. As shown in FIG. **5**, a district administrator may view bus routes across a school district, although an individual school may also be shown and made available to a ride requestor device **110** through server **135** as well.

User interface **500** provides route information interface **505** for a plurality of elementary schools, including route **299-1**, which was created as shown in FIG. **4**, as route number **299-1** of route information interface **505**. Route number **299-1** is selected as the desired information from route information interface **505**. As such, detailed information for route **299-1** is provided in route details interface **299-1**. Route details interface **510** provides information about the route creation date, the route group number, the requirements associated in terms of special education and wheelchair access. Route details interface **510** may also include information about the days of the week and times of the day that a particular rout is run, the duration of the route, the distance of the route, the number of students of the route and any more information available based on provider/administration interaction with route details interface **510**.

Route stops information may be provided as route stops interface **515** which may provide a list of stops, in an optimized order for a particular route, which may be optimized, as discussed above. Student information interface **520** may also be provided to show which students are

associated with a particular route to ensure that the students who are picked up are delivered to the right school or the right drop off location.

User interface **500** may also provide a user with a view of map **525**, which may be changed or selected based on selecting a day (or plurality of days) from map interface buttons **530**. Map **520** may illustrate route **535** for the new route selected in route information interface **505** and a plurality of stops **540**A-**540**F shown in route stops interface **515**. User interface **500** may further provide a list of unassigned riders **545** (or goods in other examples) who or which need to be assigned to route **535** or another route shown in route information interface **505** (e.g., another bus, in this example, which may be traveling through the area and could stop more efficiently/optimally, to pick up the unassigned students). When information has been reviewed through user interface **500**, a user may choose to use control buttons **550** (e.g., a route update button) to update the route as shown and notify fleet routing system **100** of the update.

FIG. **6** illustrates an exemplary embodiment of a user interface **600** illustrating a view of fleet routes with menu for editing route details in fleet routing system **100**. User interface **600** may be accessed from user interface **500** by interacting with a button, such as button **605** to create a menu **610** of actions which may be implemented by fleet routing system **100**. For example, menu **610** may allow a user to request fleet routing system **100** show a published route **615**, revert to a previously published route **620**, edit route details **625**, change a route group **630**, or show a route group **635**. As shown in FIG. **6**, a provider/administrator/requestor user may select edit route details **625** by a selector **640**. Menu **610** may be a dropdown menu which is accessible over user interface **500**, shown in FIG. **5** and discussed above.

User interface **600** may also include the elements of user interface **500**. For example, User interface **600** illustrates a view of all fleet routes for a particular entity. As previously discussed, an entity could be any governmental entity or company that operates a fleet of vehicles, although as shown in FIG. **5**, an exemplary bus route is provided on, for example, a provider device **130** or an administrator device **125** where the administrator is an administrator of the entity. As shown in FIG. **6**, a district administrator may view bus routes across a school district, although an individual school may also be shown and made available to a ride requestor device **110** through server **135** as well.

User interface **600** provides route information interface **505** for a plurality of elementary schools, including route **299-1**, which was created as shown in FIG. **4**, as route number **299-1** of route information interface **505**. Route number **299-1** is selected as the desired information from route information interface **505**. As such, detailed information for route **299-1** is provided in route details interface **299-1**. Route details interface **510** provides information about the route creation date, the route group number, the requirements associated in terms of special education and wheelchair access. Route details interface **510** may also include information about the days of the week and times of the day that a particular rout is run, the duration of the route, the distance of the route, the number of students of the route and any more information available based on provider/administration interaction with route details interface **510**.

Route stops information may be provided as route stops interface **515** which may provide a list of stops, in an optimized order for a particular route, which may be optimized, as discussed above. Student information interface **520** may also be provided to show which students are

associated with a particular route to ensure that the students who are picked up are delivered to the right school or the right drop off location.

User interface **600** may also provide a user with a view of map **525**, which may be changed or selected based on selecting a day (or plurality of days) from map interface buttons **530**. Map **520** may illustrate route **535** for the new route selected in route information interface **505** and a plurality of stops **540**A-**540**F shown in route stops interface **515**. User interface **600** may further provide a list of unassigned riders **545** (or goods in other examples) who or which need to be assigned to route **535** or another route shown in route information interface **505** (e.g., another bus, in this example, which may be traveling through the area and could stop more efficiently/optimally, to pick up the unassigned students). When information has been reviewed through user interface **600**, a user may choose to use control buttons **550** (e.g., a route update button) to update the route as shown and notify system **100** of the update.

FIG. **7** illustrates an exemplary embodiment of a user interface **700** for editing route details in fleet routing system **100**. User interface **700** provides a provider/administrator/ride requestor user an interactive interface to make edits to a particular route created within fleet routing system **100**. User interface **700** provides route information interface **505** for a plurality of elementary schools, serviced by a particular school district, in this example. Route information interface **500** may provide a list of each route to and from a particular elementary school, a time the route starts, a duration of the route, and the number of students who ride on that route. Here, again, this disclosure is not limited to use with school buses but may be applied to any fleet of vehicles that deliver goods, services, or passengers, as discussed herein. User interface **700** may provide interfaces to allow a provider/administrator/ride requestor to edit a particular route.

User interface **700** includes control buttons **705** which, based on user interaction, allow a user to edit route details or information (e.g., a save edits button or a cancel button). User interface **700** may further include a route identification interface **710**, a route effective date interface **715**, and a route end date interface **720**. A user may select and provide information to any one or all of route identification interface **710**, a route effective date interface **715**, and a route end date interface **720**. User interface **700** may further allow a provider/administrator/ride requestor user to specify a route type for a particular route, including a general education route, a special ed route, or a wheelchair route at route type interface **725**. In this case, route **201**-B is selected for editing. The edit to route **201**-B provides a bus through vehicle type interface **730** which is wheelchair capable for a special education route which runs on Mondays, through route day selection interface **735**.

User interface **700** may further include a user with a view of map **525**, which may be changed or selected based on selecting a day (or plurality of days) from map interface buttons **530**. Map **520** may illustrate route **535** for the new route selected in route information interface **505** and a plurality of stops **540**A-**540**F shown in route stops interface **515**. User interface **600** may further provide a list of unassigned riders **545** (or goods in other examples) who or which need to be assigned to route **535** or another route shown in route information interface **505** (e.g., another bus, in this example, which may be traveling through the area and could stop more efficiently/optimally, to pick up the unassigned students). When information has been reviewed through user interface **600**, a user may choose to use control

buttons **550** (e.g., a route update button) to update the route as shown and notify fleet routing system **100** of the update.

FIG. **8** illustrates an exemplary embodiment of a user interface **800** illustration a map **800** with route identification and timing in fleet routing system **100**. User interface **800** may be provided based on creating a new route, as discussed with respect to FIG. **5** or may be provided based on editing a previously established route, as discussed with respect to FIG. **7**. User interface **800** may further be provided to any of ride requestor device **110**, user device **115**, driver device **120**, administrator device **125**, or provider device **130** by server **135** through communications network **105**.

User interface **800** illustrates a map-timeline, as previously discussed with respect to FIG. **4**. As shown in user interface **800**, map **805** and timeline view **825** are illustrated together. Map **805** includes a view of each route associated with route **201**, such as route **201-1 810**, route **201-2 815**, and route **201-3 820**. Timeline view **825** illustrates that route **201-1** (element number **810**) begins at 7:06 AM at 450 Harris St., has a duration of 55 minutes over a distance of 6.1 miles and has 99 stops with 99 students, as merely an explanatory route. Route **201-1** ends at 8:01 AM at 909 Pepperidge Way and begins to travel (element **830**) to the next pickup location at 2.59 PM at 116 Picton Avenue for route **201-2**. At 116 Picton Avenue, route **201-2** commences (element **815**) to drive for 1 hour and 38 minutes over a distance of 9.8 miles across 5 stops for 11 students. Route **201-2** ends at 9 Mason Avenue at 4:37 PM. Once the children are dropped off from the school bus, the driver may travel to 225 Taylor Street by 5:24 PM over a duration of 22 minutes and a distance of 2.4 miles (element **835**). At 225 Taylor Street, route **201-3** begins to pick up 13 students and drop them off at 11 stops over a duration of 1 hour and 2 minutes and a distance of 8.5 miles to 901 Forest Boulevard at 6:26 PM. Timeline view **460** may be color coded such that route **201-1** (element **810**) may be blue, route **201-2** (element **815**) may be purple, and route **201-3** (element **820**) may be orange, for example. A start and stop location may also be color coded to indicate which location is a start location and which location is a stop location for a particular route The color coding may be used on a map **805** view and in timeline view **825** as the same color for representative consistency. It is noted that the color coding discussed herein is merely exemplary and any route in map **805** or timeline view **825** can be designated in any color so long as there is consistency in color for the same route shown in map **805** and in timeline view **825**.

The foregoing description has been presented for the purposes of illustration and description. It is not intended to be exhaustive or to limit the disclosure to the precise form disclosed. Many modifications and variations are possible in light of the above disclosure and teachings. Further, it should be noted that any or all of the aforementioned alternate implementations may be used in any combination desired to form additional hybrid implementations of the disclosure. For example, components described herein may be removed and other components added without departing from the scope or spirit of the embodiments disclosed herein or the appended claims.

Further, although specific implementations of the disclosure have been described and illustrated, the disclosure is not to be limited to the specific forms or arrangements of parts so described and illustrated. The scope of the disclosure is to be defined by the claims appended hereto, any future claims submitted here and in different applications, and their equivalents.

What is claimed is:

1. A graphical user interface displayed on a device screen by a processor, comprising:

a route identification interface element which specifies a new route for a vehicle in a fleet of vehicles;

a plurality of route type buttons in the graphical user interface;

a vehicle type interface comprising a list of types of vehicles to select for the vehicle in the fleet of vehicles;

a stop order interface, identifying one or more stops for the vehicle in a fleet of vehicles along for the new route;

a map, the map including a graphical display of the new route and the one or more stops for the vehicle in the fleet of vehicles along the new route;

a control button selectable for providing a utilization view in place of the map for one or more vehicles in the fleet of vehicles, the utilization view including a graphical representation of one or more vehicles in the fleet of vehicles which is available to drive the new route during a specified time on a specified day, the availability of the one or more vehicles in the fleet of vehicles being identified by one or more utilization indicators which are representative of one of the one or more vehicles in the fleet of vehicles being scheduled to service an assigned route, and

wherein the utilization indicators are color coded by the processor to identify the vehicle among the one or more vehicles in the fleet of vehicles that are available for the specified time on the specified day,

wherein the processor determines how the new route affects the assigned route for one of the one or more vehicles in the fleet of vehicles, and

wherein the processor automatically augments the graphical user interface timeline view on the display screen with the new route in the timeline view, new stop locations, and new stop times; and

an assignment button, accessible through the graphical user interface, which assigns the new route to the vehicle among the one or more vehicles in the fleet of vehicles and causes the route to be published to a fleet routing system.

2. The system of claim **1**, wherein the control button for accessing a utilization view for one or more vehicles in the fleet of vehicles comprises providing a utilization view based on viewing all routes in a fleet routing system.

3. The graphical user interface displayed on a device screen of claim **1**, wherein the control button for accessing a utilization view for one or more vehicles in the fleet of vehicles comprises providing a utilization view based on route groups in the fleet routing system that can accommodate the new route.

4. The graphical user interface displayed on a device screen of claim **1**, wherein the utilization indicators further identify that a route is available but impractical due to time constraints on the new route in view of other scheduled routes for that vehicle among the fleet of vehicles.

5. The graphical user interface displayed on a device screen of claim **1**, further comprising a timeline view which identifies the new route.

6. The graphical user interface displayed on a device screen of claim **5**, wherein timeline view includes another route previously assigned to the vehicle.

7. The graphical user interface displayed on a device screen of claim **6**, wherein the timeline view includes a start time and a start location for each route for the vehicle.

8. The graphical user interface displayed on a device screen of claim 7, wherein the timeline view includes an end time and an end location for each route for the vehicle.

9. The graphical user interface displayed on a device screen of claim 8, wherein each route for the vehicle is color coded in the timeline view.

10. The graphical user interface displayed on a device screen of claim 1, further comprising a map with color coded route indicators which specify each route for the vehicle.

11. A system, comprising:

a processor implementing a graphical user interface displayed on a device screen associated with a user, the user being one of a provider, an administrator, and a ride requestor, the graphical user interface further comprising:

a route identification interface element which specifies a new route for a vehicle in a fleet of vehicles;

a plurality of route type buttons in the graphical user interface;

a vehicle type interface comprising a list of types of vehicles to select for the vehicle in the fleet of vehicles;

a stop order interface, identifying one or more stops for the vehicle in a fleet of vehicles along for the new route;

a map, the map including a graphical display of the new route and the one or more stops for the vehicle in the fleet of vehicles along the new route;

a control button selectable for providing a utilization view in place of the map for one or more vehicles in the fleet of vehicles, the utilization view including a graphical representation of one or more vehicles in the fleet of vehicles which is available to drive the new route during a specified time on a specified day, the availability of the one or more vehicles in the fleet of vehicles being identified by one or more utilization indicators which are representative of one of the one or more vehicles in the fleet of vehicles being scheduled to service an assigned route, and

wherein the utilization indicators are color coded to identify the vehicle among the one or more vehicles in the fleet of vehicles that are available for the specified time on the specified day,

wherein the processor determines how the new route affects the assigned route for the one of the one or more vehicles in the fleet of vehicles, and

wherein the processor automatically augments the graphical user interface timeline view on the display screen with the new route in the timeline view, new stop locations, and new stop times; and

an assignment button, accessible through the graphical user interface, which assigns the new route to the vehicle among the one or more vehicles in the fleet of vehicles in the fleet routing system and causes the route to be published to a fleet routing system.

12. The system of claim 11, wherein the control button for accessing a utilization view for one or more vehicles in the fleet of vehicles comprises providing a utilization view based on viewing all routes in the fleet routing system.

13. The system of claim 11, wherein the control button for accessing a utilization view for one or more vehicles in the fleet of vehicles comprises providing a utilization view based on route groups in the fleet routing system that can accommodate the new route.

14. The system of claim 11, wherein the utilization indicators further identify that a route is available but impractical due to time constraints on the new route in view of other scheduled routes for that vehicle among the fleet of vehicles.

15. The system of claim 11, further comprising a timeline view which identifies the new route and another route previously assigned to the vehicle.

16. The system of claim 15, wherein timeline view includes another route previously assigned to the vehicle.

17. The system of claim 16, wherein the timeline view includes a start time and a start location for each route for the vehicle.

18. The system of claim 17, wherein each route for the vehicle is color coded in the timeline view.

19. The system of claim 11, further comprising a map with color code route indicators which specify each route for the vehicle.

20. The system of claim 11, wherein one or more of a timeline view and a map view including color coded route indicators are provided to a driver device through a communication device by a server device.

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